

# Identifying, Designing and Executing Repairs, Replacements and Additions at Transferred Works Facilities

Stakeholders Workshop  
Denver, Colorado



# Topics

- Reclamation Mission
- Identifying Repair Needs
- Operation and Maintenance Issues
- Maintenance Plans
- Reclamation Transparency Law and Title Transfer
- Reclamation Assistance
- Collaboration with Transferred Works



# Reclamation Mission

**The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.**





# OM&R

- Transferred Works
- Reserved Works





# OM&R – Transferred Works

- Congressional Intent
- Federal Role
- Local Role
- Public Infrastructure and Public Funding
- Public v. Private and Federal v. Local





# OM&R – Reserved Works





# Identifying Repair and Replacement Needs at Transferred Works

- **Condition Assessments**
  - Reclamation review/examination programs
  - Transferred Works Maintenance Program
- **Self Identification**
  - Upgrades (variable frequency, efficiency increase, canal lining)
  - Planned repairs (preventative maintenance)
  - Unscheduled repairs (failure)



# Condition Assessments

- Oversight is accomplished through Review Programs
- Review Programs established to ensure safe and reliable operations of Reclamation assets
- Review Programs structured on risk failure to Reclamation's mission and public safety





# Major Review Programs

Program	Description
High and Significant Hazard Dam Examinations	Review and examination program for High and Significant Hazard dams
Power Review of Operation and Maintenance Program (PRO&M)	Review to ensure power facilities are operated in a safe, reliable manner, in compliance with applicable regulatory standards
Canal Hazard Program	Periodic review of canals that have potential to cause physical damage to life or property
Bridge Inspection Program	Detailed structural examination of bridges per National Bridge Inspection standards
Water Review of Operation and Maintenance Program (WRO&M)	Evaluation of facility condition through on-site inspections by one office removed for Reclamation's water related associated facilities.



# Operation and Maintenance Recommendations

- Review team makes recommendations to correct deficiencies at facilities
- Purpose of recommendations:
  - To document the need to take action to remediate a noted deficiency that has the likelihood of impacting the intended performance of a facility.
  - To indicate the relative adequacy of the level of operation and maintenance being performed by the operating office/entity.





# Recommendation Categories

- Category 1 recommendation: made for the correction of severe deficiencies where immediate and responsive action is required to ensure structural safety and operational integrity of a facility.
- Category 2 recommendation: made for a wide range of important matters where action is needed to prevent or reduce further damage or preclude possible operational failure of the facility
- Category 3 recommendation: made for less important matters but believed to be sound and beneficial suggestions to improve or enhance the operation and maintenance of the project or facility

# Category 1 Recommendation Example





# Category 2 Recommendation Example



# Category 3 Recommendation Example





# Operation and Maintenance Issues











































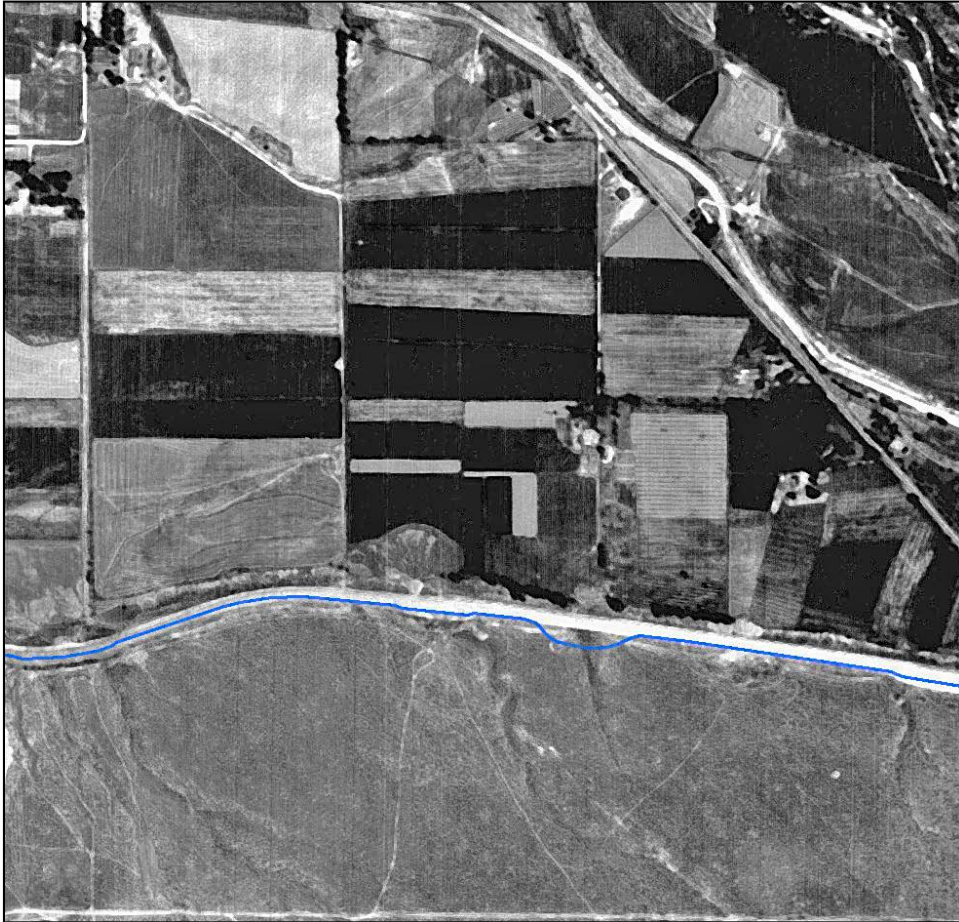




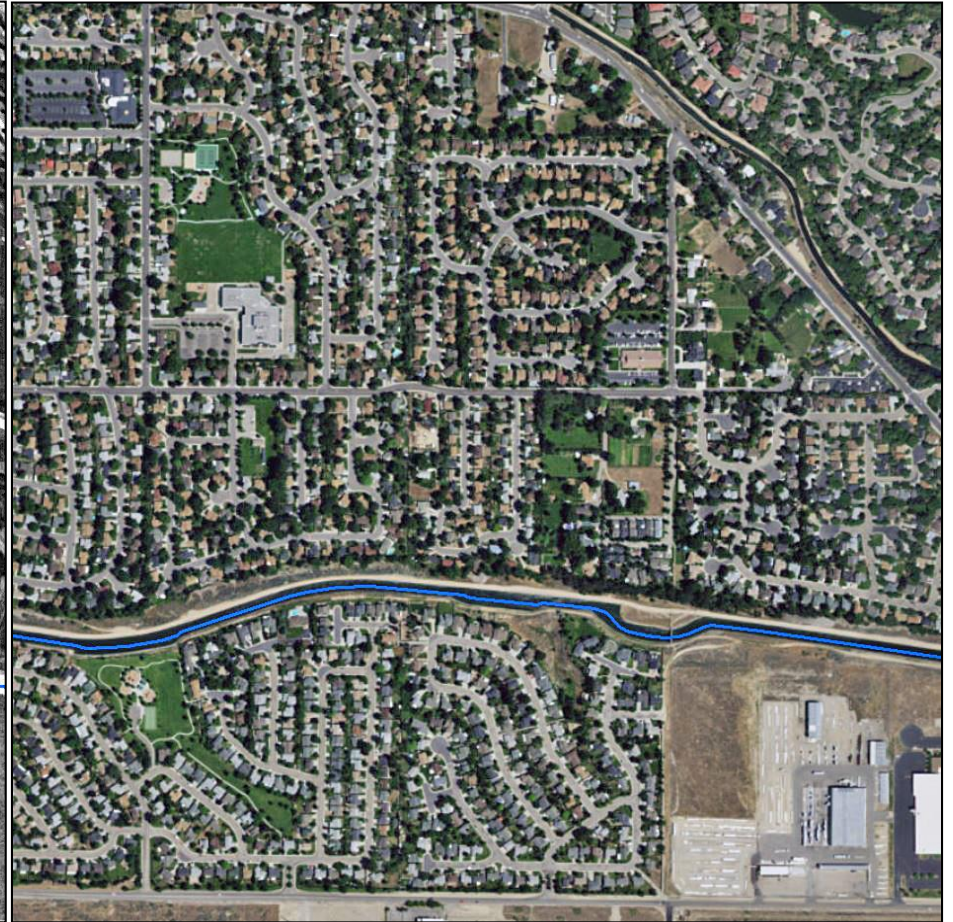


# Urbanization

1939



2015



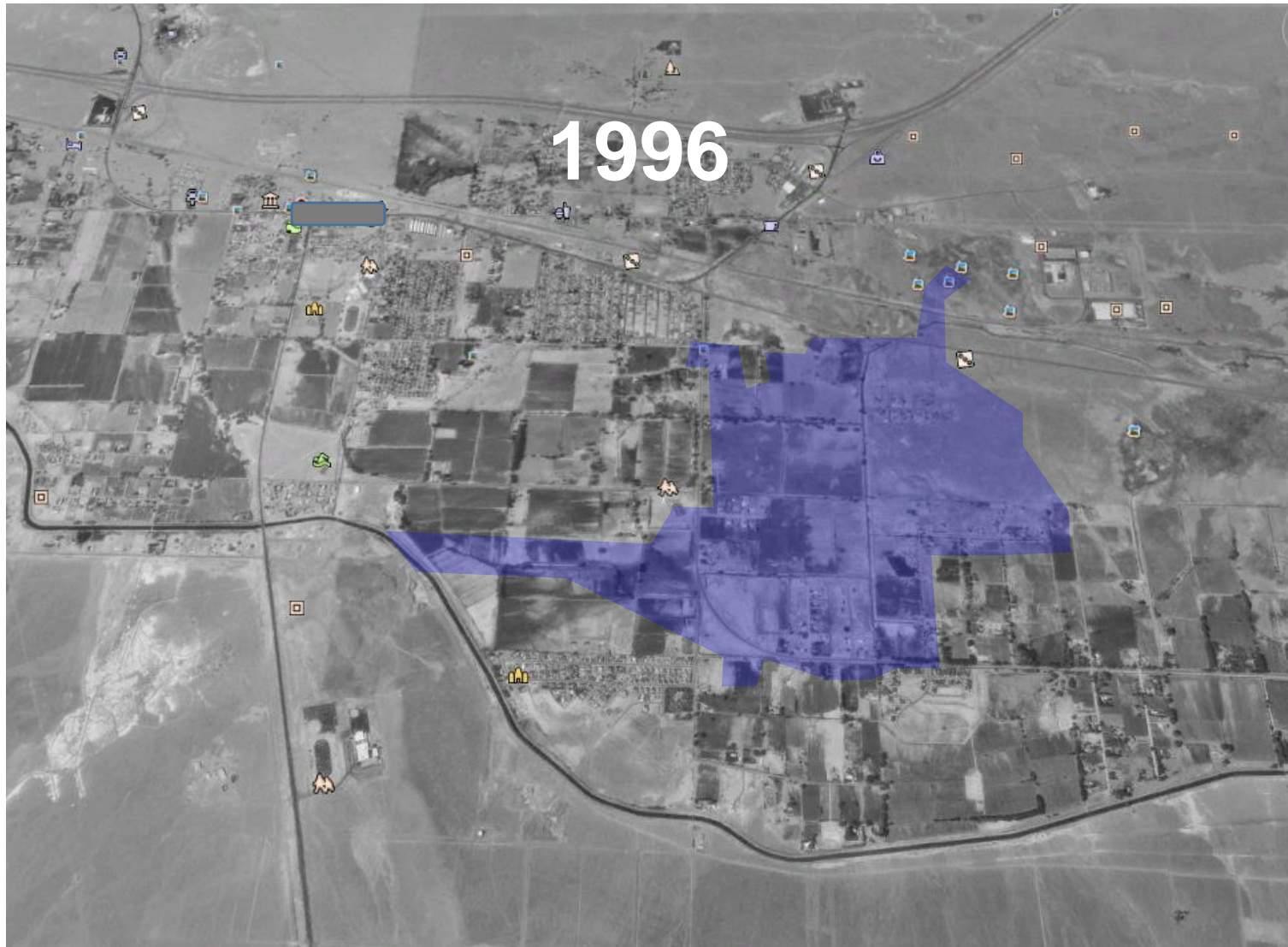


# Urbanization





# Urbanization





# Canal Failure - Consequences









# Maintenance Plans





# Operation, Maintenance and Replacement Planning





# Operation, Maintenance and Replacement Examples

- Pump Turbine
- North Fork Siphon





# Central Utah Water Conservation District Process

- Inventory
- Remaining Life
- Replacement Schedule
- Funding Schedule
- Funding Plan
- Format
- Execution and Revision





# Central Utah Water Conservation District Results

- Reserves
- Assessments
- Projects
- Coordination
- Effectiveness





# Operation, Maintenance and Replacement Planning – Objectives

- Meet the public infrastructure standard
- Reduce cost
- Garner support
- Avoid emergencies
- Identify and gather resources
- Reduce conflicts
- Improve efficiency





# Operation, Maintenance and Replacement Planning – Planning

- Time
- Expense
- Buy-in





# Operation, Maintenance and Replacement Planning – Planning

- Trends
- Constraints





# **John D. Dingell, Jr. Conservation, Management, and Reclamation Act, P.L. 116-9**

## **Title VIII – Water and Power**

### **Subtitle G - Bureau of Reclamation Transparency**

<b>Sec. 8601</b>	<b>Definitions</b>
<b>Sec. 8602</b>	<b>Asset Management Report enhancements for reserved works</b>
<b>Sec. 8603</b>	<b>Asset Management Report enhancements for transferred works</b>



# **P.L. 116-9 Reporting Requirements**

- **Produce an Asset Management Plan**
- **Provide a list of repair needs which include following elements for each activity:**
  - **Level of cost estimate**
  - **Categorical rating**
  - **Planned funding**



# Schedule for Implementation

- March 12, 2019 – law passed
- March 2021 – Asset Management Plan for reserved works
- March 2023 – Asset Management Plan for reserved and transferred works
- Asset Management Plan updates every two years after for reserved and transferred works





# Major Rehabilitation and Replacement





# What is MR&R

- **Extraordinary Maintenance (XM)**
  - Facility's annual O&M budget  $\geq 10\%$
  - Total Cost for all structures  $\geq \$100,000$
- **Safety of Dams Modifications (SOD)**
- **Deferred Maintenance (DM)**





# MR&R Data Collection

- Dynamic data collection
- 30-year planning horizon
- MR&R data
  - Work description
  - Cost information
  - Categorization of importance





# Categorization Process

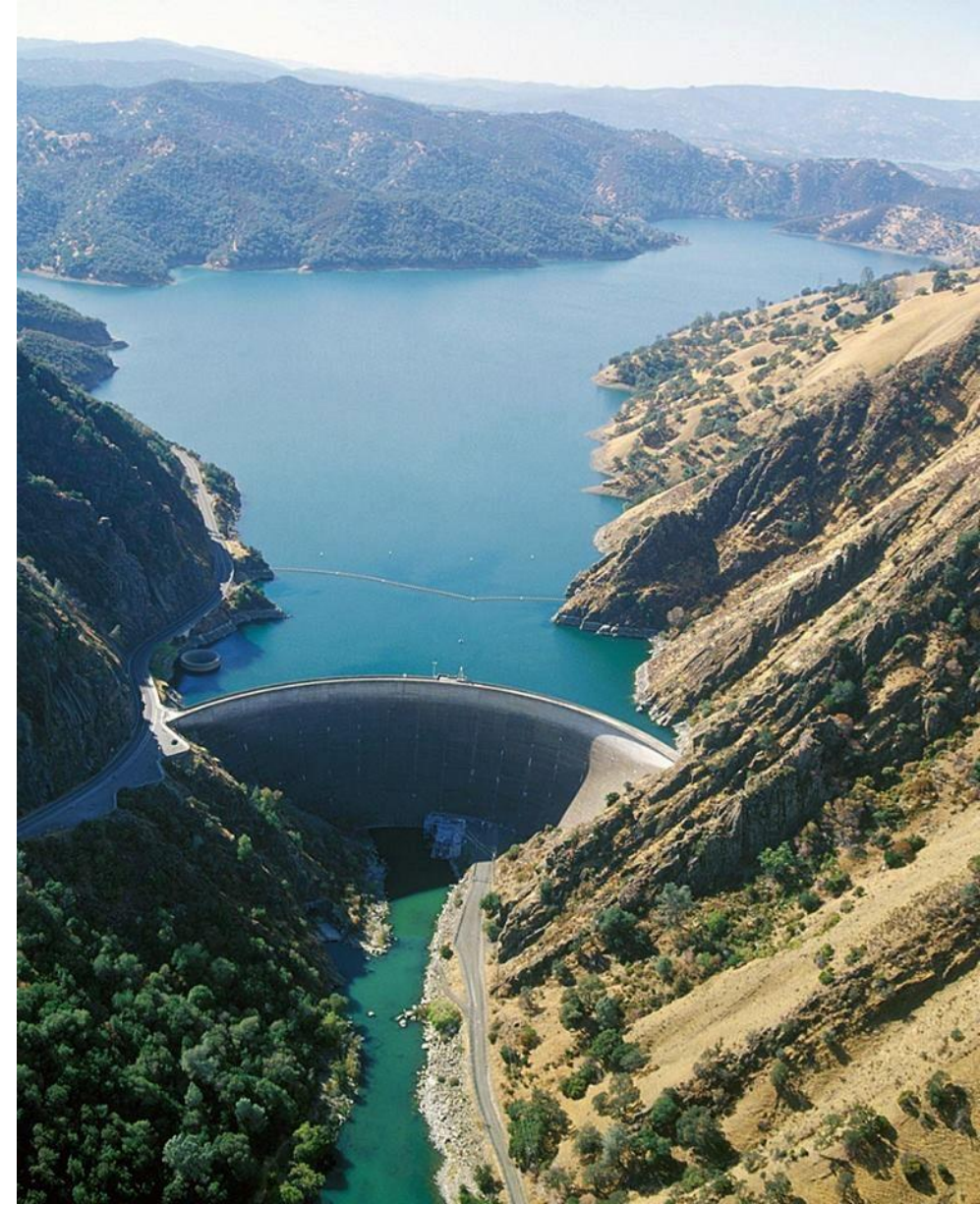
- **Step 1: Develop a risk rating**
  - **Risk = Likelihood × Consequence**





# Likelihood

- Four categories
  - High
  - Likely
  - Occasional
  - Rarely



Refer to handout for qualifiers based upon feature type



# Consequence

- **Four Categories**
  - Catastrophic
  - Critical
  - Significant
  - Minor



**Refer to handout for qualifiers based upon feature type**



# Risk Matrix

Probability	Risk Assessment Score			
High	6	8	10	10
Likely	4	6	8	10
Occasional	2	4	6	9
Rarely	2	2	4	7
Consequence	Minor	Significant	Critical	Catastrophic



# Categorization Process

- **Step 1: Develop a risk rating**
  - **Risk = Likelihood × Consequence**
- **Step 2: Qualify Benefits**
  - **Benefits = Mission Enhancement  
+ Return on Investment**





# Qualify Benefits

## 1) Mission Enhancement

- Major
- Moderate
- Low

## 2) Investment Rating

- High
- Medium
- Low

See handout for qualifiers





# Qualify Benefits

Investment Rating	Benefits Score		
Major (<7 years)	3	4	5
Moderate (7-15 years)	2	3	4
Low (> 15 years or Unknown)	1	2	3
Mission Enhancement	Minimal	Moderate	Major

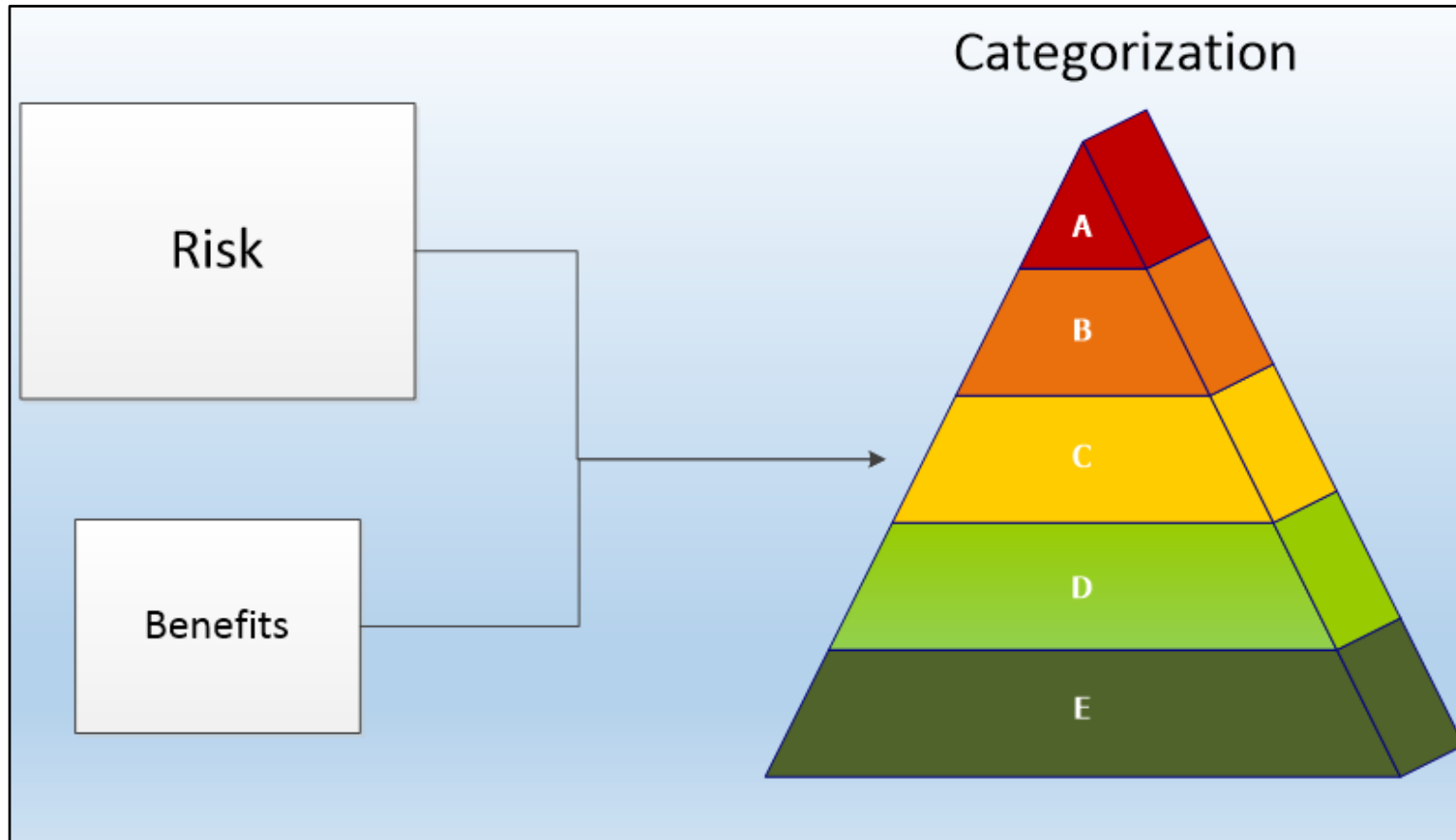


# Categorization Process

- **Step 1: Develop a risk rating**
  - **Risk = Likelihood × Consequence**
- **Step 2: Qualify Benefits**
  - **Benefits = Mission Enhancement  
+ Return on Investment**
- **Step 3: Finalize Categorization**
  - **Risk + Benefits**

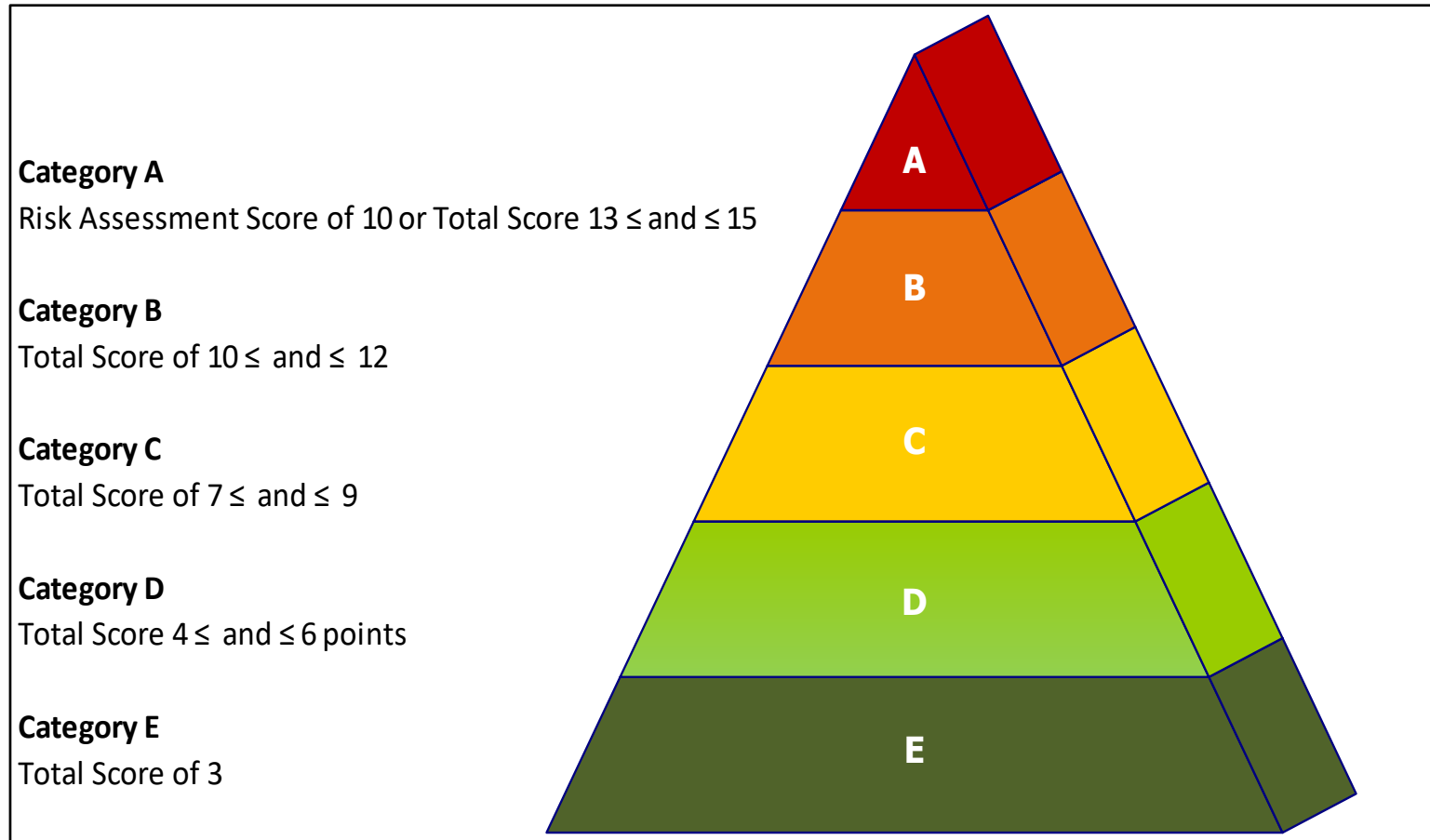


# Investment Categorization





# Investment Categorization



# Strategic Asset Management Plan (SAMP)

- Describes practices and strategies to strategically evaluate and manage Reclamation's infrastructure
- Serves as the initial transition to align Reclamation with international standards on Asset Management (ISO-55000)
- Provides a reporting framework consistent with requirements of Reclamation Transparency Act 2019



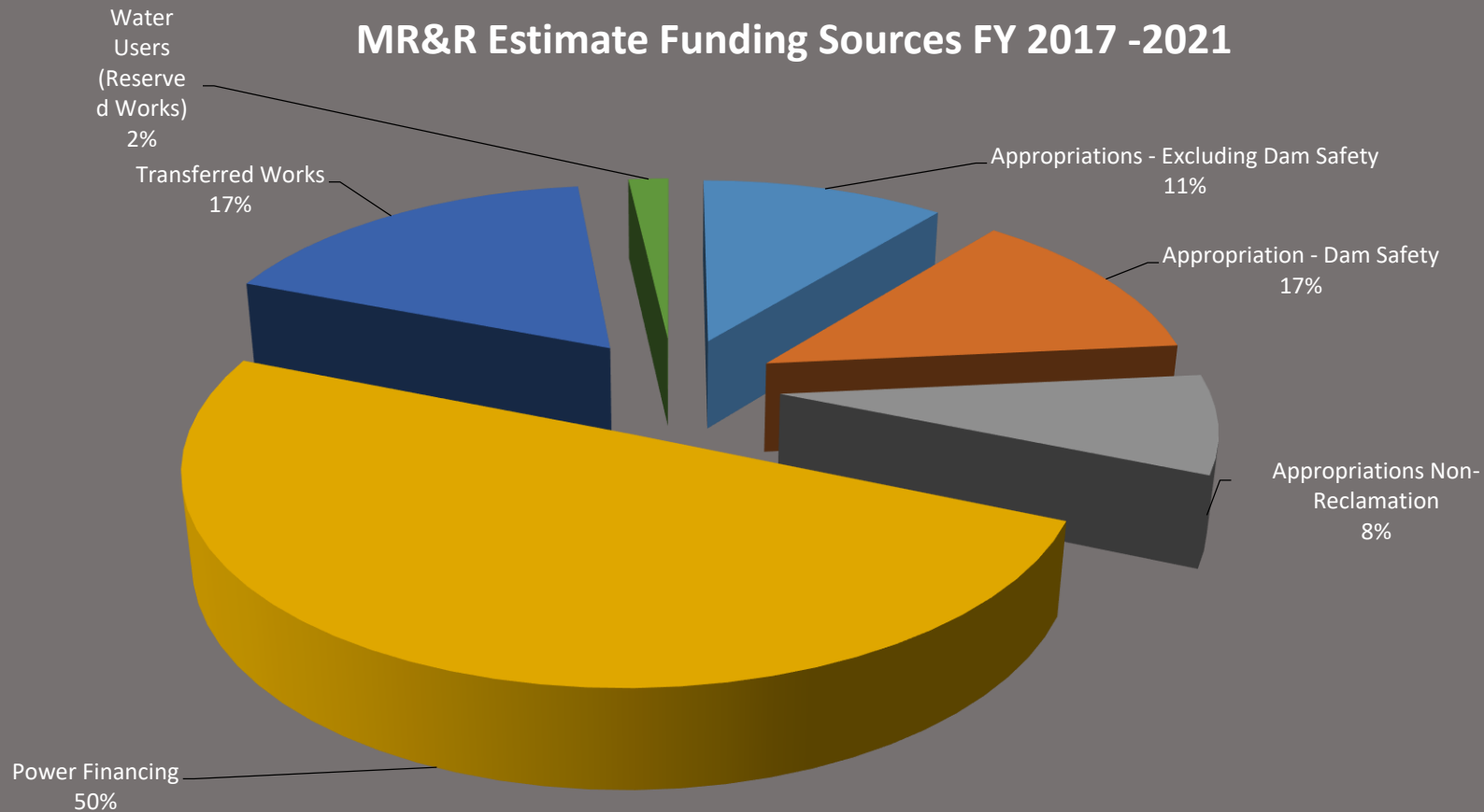


# SAMP Schedule

- **Current draft FY 2019 Draft SAMP in internal review phase**
- **Targeted release – Summer 2019**
- **Reclamation will continue engagement with stakeholders at the local and regional levels to identify infrastructure needs through annual Major Rehabilitation and Replacement update.**

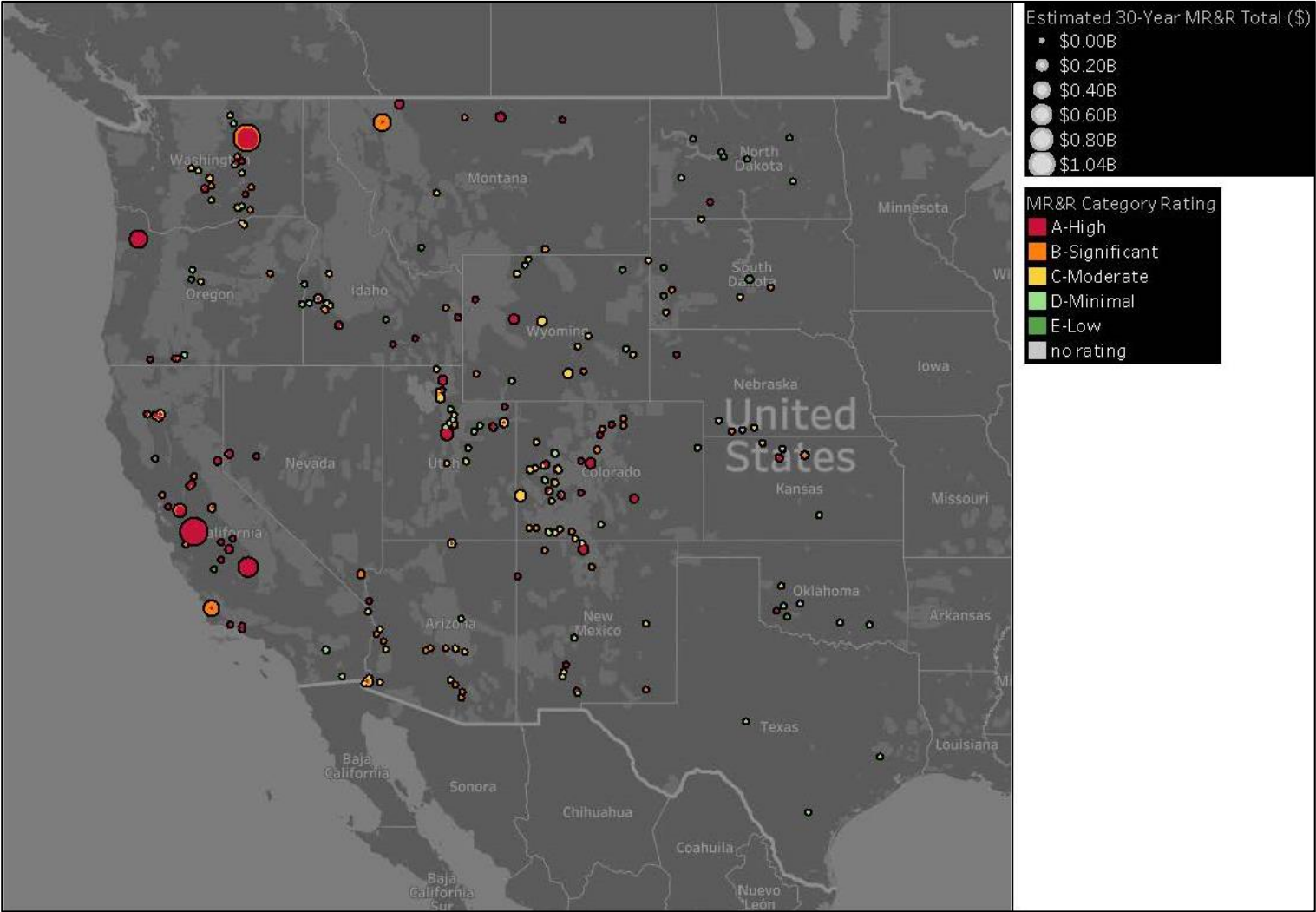


# Strategic Asset Management Plan

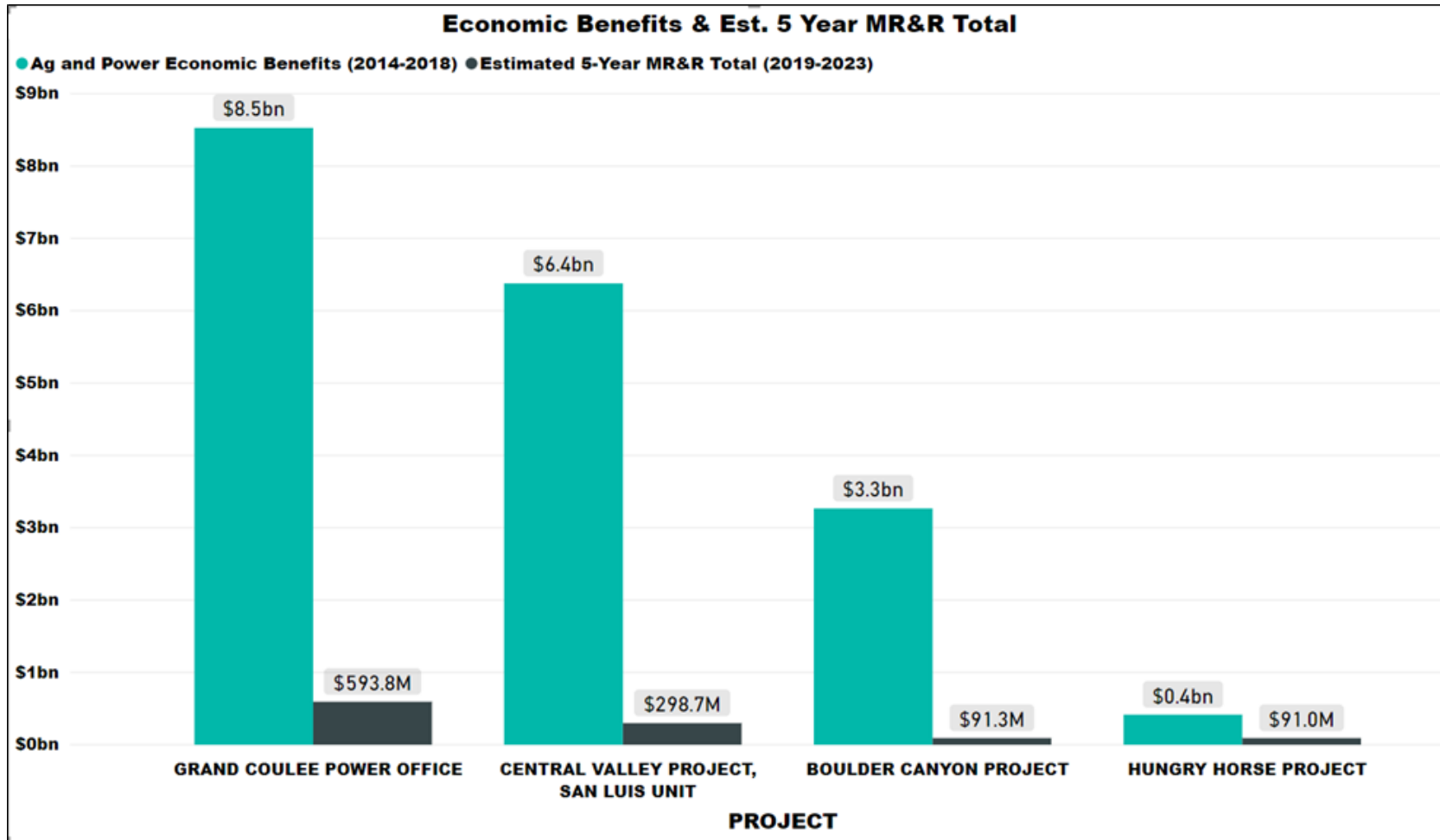




# Strategic Asset Management Plan



# Project Benefits vs Repair Needs





# Reclamation Title Transfer Authority

- Signed into law March 12, 2019
- Very high priority for Reclamation
- Eliminates need for specific authorization
- Goal is to save time and reduce costs
- Current status
  - Reclamation team formed
  - Eligibility criteria being developed
  - Temporary Directive and Standard on Title Transfer and Categorical Exclusion (mid-May)



# Reclamation Assistance

- **Operation and Maintenance Guidelines**

- Vegetation Management
- Animal Management
- Concrete Repair
- Mechanical Maintenance and Repair
- Embankment Maintenance and Repair
- Canal Operator Manual

- **Training**

- Dam Operator Training
- Canal Operator Training
- SEED Seminars
- Technical Service Training
- Water Management Workshop
- Local Training



# Collaboration on Substantial Changes at Reclamation Transferred Works



# Collaboration on Substantial Changes at Transferred Works

- At times, uncoordinated changes have resulted in adverse consequences









# Collaboration on Substantial Changes at Transferred Works

- At times, uncoordinated changes have resulted in adverse consequences
- Draft D&S developed
- Parity in standards; risk-based approach
- Existing Contract Requirements
- Costs are non-reimbursable (design review and construction monitoring)
- Focus on collaboration
- D&S establishes authorized official
- Recently concluded public comments
- In process of finalizing





# Collaboration on Substantial Changes at Transferred Works Dam Safety

- The Dam Safety Office reviews ANY modification to a high or significant hazard facility where there could be an adverse impact on risk:
  - Structural modifications
  - Changes in operations
  - Changes in storage
  - Lease of Power Privilege
- Similar process for SOD work; risk analysis, report, review and DSAT







# Substantial Changes – Provo Area Office

- Jordan Aqueduct Relocation
- Olmsted Powerplant Replacement
- Southwest Aqueduct Relocation
- Suasey Diversion Winter Flow Modification
- Hyrum Mendon Pump Canal Piping
- Hyrum Mendon Reinforced Concrete Pipe Placement
- Yellowstone Feeder Canal Lining
- Newton Canal Piping and Outlet Works Connection
- Ogden Canyon Pipeline Trestle Repair
- Ogden Canyon Siphon Replacement
- Deer Creek Fill Line Replacement
- Deer Creek Tube Valve Replacement
- Ephraim Tunnel Lining
- High Line Canal Check Structure
- High Line Canal Highway Crossing
- Power Canal Sinkhole Fix
- Steinaker Service Canal Piping
- Layton Siphon Extension
- Willard Canal Lining
- WCWEP Canal Lining
- North Fork Siphon Replacement



# Substantial Changes - Reclamation

- 404 Permitting
- Constructability Review
- Construction Management
- Contracts and Repayment
- Design Review
- Drilling
- Environmental Compliance
- Force Account Work
- GIS
- Inspection
- Lab Work
- Lands
- O&M Review
- Planning
- Risk Analyses
- Water Rights

# Substantial Changes - Tips

- Definition
- Engage Early
- Single Point of Contact
- Establish and Hold Deadlines
- Seek Contribution of Time and Funding
- Plan with Reclamation
- Schedule with Reclamation Contingencies





# Reclamation Design Standards

- **Technical Service Center Design Standards**

- Sound Engineering Judgement
- Applicable National Codes and Design Standards
- Site-Specific Technical Considerations
- Project-specific Considerations
- Reclamation Manual FAC 03-03, *Design Activities*

- **TSC Design Standards:**

<https://www.usbr.gov/tsc/techreferences/designstandards-datacollectionguides/designstandards.html>

- **Contact your local area office for more information**



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**RECLAMATION**  
*Managing Water in the West*